

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Carrier Current Systems, including Broadband over)	
Power Line Systems)	ET Docket No. 04-37
)	
Amendment of Part 15 regarding new requirements)	
and measurement guidelines for Access Broadband)	
over Power Line Systems)	

Comments of Robert L. Atkinson

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I respectfully submit these comments in response to the Notice of Proposed Rule Making (NPRM), *In the Matter of Carrier Current Systems, including Broadband over Power Line Systems; Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband over Power Line Systems*, ET Docket No. 03-104, ET Docket No. 04-37, in 69 Fed. Reg. 12,612, proposed Mar. 17, 2004 for 47 C.F.R. pt. 15. These comments are timely filed.

Abstract: I state that the FCC's acceleration of the rule making process, to the extent that requests for filing deadline extensions were denied, is without justification, that the FCC is naïve and apparently uninformed with regard to the dilemma BPL access systems pose to many Amateur Radio Service stations and short wave listeners, and that in all likelihood, Part 15 will not go far enough to protect many Amateur Radio Service stations and short wave listeners from harmful interference caused by Access BPL.

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The FCC is naïve and apparently uninformed with regard to the dilemma BPL access systems pose to many Amateur Radio Service stations and short wave listeners.

1. As late as March 23rd of this year, the FCC's chief engineer, Mr. Ed Thomas, was quoted in a Wall Street Journal story on BPL interference to amateur radio as follows:

Why is this thing a major calamity? And honestly, I'd love the answer to that." (1)

Elsewhere, in paragraph 35 of the NPRM, the following appears:

We recognize that amateur operations are likely to present a difficult challenge in the deployment of Access BPL in cases where amateurs use high gain outdoor antennas that are located near power lines. In considering this interference potential, we note that [the American Radio Relay League] acknowledges that noise from power lines, absent any Access BPL signals, already presents a significant problem for amateur communications. We therefore would expect that, in practice, many amateurs already orient their antennas to minimize the reception of emissions from nearby electric power lines.

These statements, in order, indicate firstly, an astonishing lack of understanding of a basic electrical (physical) law, by the FCC's *chief engineer*, to wit, that an unshielded conductor carrying radio frequency current will have about it an unrestrained electromagnetic field, and secondly, an apparent FCC obliviousness to the way in which many Amateur Radio Service stations are sited.

2. The majority of amateur stations and in all probability, short wave receivers, are located in town and urban/suburban dwellings in close proximity to power lines. In paragraph 14 of the NPRM, the results of an ARRL survey, show that 53% of respondents have antennas less than 30 meters from overhead power lines. Allow me to describe my own case, which is not unusual: I reside on a city lot measuring 100 feet by 50 feet. City owned electric power cables pass by overhead across the front side of my lot. To the north, about 75 feet away, more lines run between wooden poles along a nearby street. Fifty feet behind my lot and parallel to the east bank of the Fox River, which flows through Saint Charles, are high voltage power lines owned by the Commonwealth Edison Corporation. There are a plethora of overhead power lines in this area because it is an older part of the city, with homes over 100 years old. *Many amateurs reside in such places because they are the most likely to be free from restrictive covenants banning the construction of outdoor antennas.*

3. My main antenna for HF frequency transmission and reception is a wire horizontal loop measuring 240 feet in length, which is used on all amateur wavelengths from 10 to 80 meters. One side of this antenna is parallel to, and only 20 feet away from, the power cables on the front side of my lot. With such limited space, there is no way to isolate such an antenna from an Access BPL field should one radiate from these power lines. For the amateur HF frequencies below 14 MHz, construction of a rotating directional antenna at my location is a physical impossibility, and if it were possible, it would not provide much relief since the electric service lines are in such close proximity. *Therefore, orienting an antenna to minimize the reception of emissions from nearby electric power lines is not an option, and is really only feasible when the amateur station is located on a fairly substantial area of land which many amateurs do not possess. Further, limiting a station to certain directional orientations, would limit that station's directional transmission and reception, which would be untenable due to the vagaries of radio propagation.*
4. The NPRM excerpt bases the assumption that amateurs locate their antennas to avoid nearby power lines, on the notion that this is the way amateurs solve the problem of interference from broad, pulse radiation, produced by arcing contacts on these lines. Assuming this is true, it would be one of the last methods taken towards relief from interference. Unlike Access BPL, a power line arc is a *malfunction*, a condition that is normally in need of repair. It is a single point problem causing emissions. Once it is corrected, not only is a loss of energy prevented (which is desired by many power companies), but short wave emissions are halted also. *The vast majority of power line interference problems are therefore solved by locating the source of the interference and halting its activity—something the FCC has aided amateurs in doing in some cases—and not merely reorienting antennas.* In the case of Access BPL, the activity causing the interference would be a desirable one to non-HF users and utilities; not a problem, and the radiating fields would be appearing on all local service conductors—very much a different situation from a single point problem. Using the problem of power line arcing RFI, as a basis for an assumption that amateurs and short wave listeners are already capable of minimizing the effects of Access BPL RFI, is therefore flawed. Based on the previous analysis, I submit that there is evidence of an apparent and substantial lack of understanding of the typical amateur station milieu vis-à-vis Access BPL, and further, that all parties would be served better by the relocation of Access BPL to a part of the spectrum in which sky wave propagation is not the norm, and where the noise floor would truly rise only a short distance from the power lines in use.

Part 15 will not go far enough to protect many Amateur Radio Service stations and short wave listeners from harmful interference.

5. Paragraph 34 of the NPRM states:

...we note that Access BPL will operate in compliance with the current Part 15 rules that limit emissions from unlicensed carrier current systems to very low power levels in comparison to licensed radio operations.

Many communications situations in the Amateur Radio Service involve weak signal work on the HF frequencies. A large percentage of licensed amateurs transmit with extremely low power levels, often under 5 watts. Others may employ higher power levels but with compromised antennas. The result is that the field strengths at receiving stations are often extremely weak. Amateur radio receivers have become very sensitive as a product of the advancement of the state of the art. The receiver sensitivity of one recent design available to amateurs on the market today has been measured at less than 0.18 microvolts (2) an extraordinary sensitivity. In their Phase 1 Study (NTIA Report 04-413) with the title *Potential Interference From Broadband Over Power Line (BPL) Systems to Federal Government Radiocommunications at 1.7 – 80 MHz*, the National Telecommunications and Information Administration found that interference to fixed stations receiving “moderate-to-strong signals” would be likely at 230 meters from a BPL device and its attached power lines.(3) This is hardly a weak field that would not impede reception of weak ionospherically propagated signals which modern receivers were designed to detect.

6. Further, in paragraph 20 of the NPRM, it is reported that BPL equipment manufacturers and service providers have not received any complaints of interference from BPL and that existing Part 15 rules offer adequate protection to HF occupants. But in fact, there are several cases of BPL interference to amateur radio stations. In one of the more notorious cases it has been reported that in Raleigh North Carolina, the Progress Energy Corporation claimed to have eliminated harmful interference from its BPL trial site, and was in compliance. However, observations conducted there after this claim was made revealed the existence of interference in the amateur 20 and 15 meter bands, and incomplete BPL notching in the 17 and 12 meter bands. (4) This is clearly not adequate Part 15 compliance and seems to indicate that Part 15 is currently inadequate in this area of regulation.
7. In their Phase 1 Study, the NTIA advises against a relaxation of Part 15 field strength limits for BPL systems, but more important, they state:

Critical review of the assumptions underlying these analyses revealed that application of existing Part 15 compliance measurement procedures for BPL systems results in a significant underestimation of peak field strength. Underestimation of the actual peak field strength is the leading contributor to high interference risks. As applied in current practice to BPL systems, Part 15 measurement guidelines do not address unique physical and electromagnetic characteristics of BPL radiated emissions.(5)

There is evidently a need for a modification of Part 15 so that it is more rigorous and requires in very specific terms, field strength measurement methods and limits that will guarantee no reception of BPL radiated emissions by other HF users.

The FCC's acceleration of the rule making process, to the extent that requests for filing deadline extensions were denied, is without justification.

8. The breadth of the aforementioned NTIA study makes it one that warrants careful examination—the first phase has only recently been released. The second phase will report on tests concerning ionospheric propagation of BPL signals. It is due in the fall. There is a need for a prudent and methodical revision of Part 15 as demonstrated above, which could be worked on in a preliminary sense in the meantime. Yet, the FCC seems to be under the spell of the internet coming out of a wall outlet to the exclusion of other technologies that are much more practical, less expensive and easier to integrate in the communications world, such as wireless broadband on 5 GHz as implemented by the Motorola Canopy system for example.(6) Additionally, the FCC appears to be in a race to field BPL as if there were tens of millions of Americans crying out for broadband service. Are there? Apparently the demand for broadband service has been overblown, according to a New York Times front page story published on April 19th of this year. In this, it is revealed that a large majority of internet dial-up users have no interest in moving to broadband access and, for a variety of reasons, are content with their current service. Specifically, in a survey taken in February 2004, the Pew Internet and American Life Project found that 60 percent of dial-up users said they were not interested in switching to broadband, roughly the same result as in a February 2003 survey. Some of the reasons given for this were a feeling that the work the users did would not be speeded up much by higher data rates (usually email and downloading text) and a desire to save money (some dial-up providers charge as little as five dollars per month).(7) This is anything but a grass roots mandate from citizens to the FCC, demanding a slap-dash implementation of power line internet access. In the long run, there is much to be gained by a reasoned rational approach to resolving the existing conflicts between HF stakeholders and the BPL industry. Such an approach would take time, but it would be time well spent. An alteration to the rule making process deadlines to allow for the adequate study of NTIA Phases 1 and 2 and other reports is advisable.

1. Wall Street Journal, March 23rd, 2004, p. A1 col. 4: "In This Power Play, High-Wire Act Riles Ham-Radio Fans : *New Use for Lines Sparks Tension With Operators; 'Firestorm' in Penn Yan*" by Ken Brown.
2. Receiver specifications for the Orion model amateur radio transceiver, as given on the Ten Tec Company's website, at <http://www.tentec.com/TT565.htm>.

3. U.S. Department of Commerce, National Telecommunications and Information Administration technical report, NTIA Report 04-413, *Potential Interference From Broadband Over Power Line (BPL) Systems to Federal Government Radiocommunications at 1.7 – 80 MHz*, Phase 1 Study, Volume 1, Executive Summary p. vi. Available at <http://www.ntia.doc.gov/ntiahome/fccfilings/2004/bpl/index.html>
4. “North Carolina Utility Draws ‘Line in the Sand’ on BPL Interference Abatement” ARRL News, Apr. 22nd 2004, available at <http://www.arrl.org/news/stories/2004/04/22/2/?nc=1>
5. See note 3.
6. Information on the Motorola Canopy wireless broadband platform may be found at <http://motorola.canopywireless.com/>
7. The New York Times, April 19th, 2004, p. A1 col. 5: “In a Fast-Moving Web World, Some Prefer the Dial-Up Lane” by Matt Richtel. A typical low-cost dial-up service is Access4Less at <http://www.access4less.net/IndexGot.htm>